

## CLAIMS

What is claimed is:

- 1     1.     An optical light guide apparatus comprising:  
2             a connector;  
3             a bundle of optical fibers positioned within said connector; and  
4             an epoxy joining said optical fibers together,  
5             wherein said bundle of optical fibers has a polished distal end at one end of said  
6 connector, and  
7             wherein the ratio of fiber size to binder particulate size of said epoxy is sufficient  
8 to maintain the integrity of said bundle of optical fibers during polishing of said distal  
9 end.
- 1     2.     The apparatus in claim 1, wherein the ratio of fiber size to binder particulate size  
2 of said epoxy is above 25.
- 1     3.     The apparatus in claim 1, wherein the ratio of fiber size to binder particulate size  
2 of said epoxy is between approximately 25 and 50.
- 1     4.     The apparatus in claim 1, wherein said connector is adapted to extend through an  
2 opening in a surface of a device, such that said distal end of said bundle of optical fibers  
3 one of is recessed in, is substantially flush with, and extends from a surface of said device  
4 through which said connector extends.
- 1     5.     The apparatus in claim 1, further comprising a protective sheath surrounding a  
2 portion of said bundle of fibers that extend outward from said connector.

1 6. The apparatus in claim 5, further comprising a second connector, wherein said  
2 connector is positioned at a first end of said protective sheath and said second connector  
3 is positioned at a second end of said protective sheath that is opposite said first end of  
4 said protective sheath.

1 7. The apparatus in claim 1, wherein said optical fibers comprise one of a glass and  
2 quartz.

1 8. An optical light guide apparatus comprising:  
2 a protective sheath;  
3 a connector connected to an end of said protective sheath;  
4 a bundle of optical fibers positioned within said protective sheath and within said  
5 connector; and  
6 an epoxy joining said optical fibers together,  
7 wherein the coefficient of thermal expansion of said epoxy matches that of said  
8 connector.

1 9. The apparatus in claim 8, wherein said connector is adapted to extend through an  
2 opening in a surface of a device, such that said distal end of said bundle of optical fibers  
3 one of is recessed in, is substantially flush with, and extends from a surface of said device  
4 through which said connector extends.

1 10. The apparatus in claim 9, further comprising a seal on said connector.

1 11. The apparatus in claim 10, wherein said seal seals said opening.

1 12. The apparatus in claim 9, wherein said connector further comprises a threaded  
2 jam nut adapted to engage threads in said opening.

1 13. The apparatus in claim 8, further comprising a second connector, wherein said  
2 connector is positioned at a first end of said protective sheath and said second connector  
3 is positioned at a second end of said protective sheath that is opposite said first end of  
4 said protective sheath.

1 14. The apparatus in claim 8, wherein said optical fibers comprise one of a glass and  
2 quartz.

1 15. A method of forming an optical light guide apparatus, said method comprising:  
2 bonding a bundle of optical fibers together using an epoxy;  
3 polishing a distal end of said bundle of optical fibers to create an optical aperture,  
4 wherein the ratio of fiber size to binder particulate size of said epoxy used in said  
5 bonding process is sufficient to maintain the integrity of said bundle of optical fibers  
6 during said polishing of said distal end; and  
7 positioning said bundle of optical fibers into a protective sheath and a connector,  
8 wherein said connector is positioned at one end of said protective sheath, and  
9 wherein said distal end of said bundle of optical fibers is positioned at an end of  
10 said connector.

1 16. The method in claim 15, wherein the ratio of fiber size to binder particulate size  
2 of said epoxy used in said bonding process is above 25.

1 17. The apparatus in claim 15, wherein the ratio of fiber size to binder particulate size  
2 of said epoxy used in said bonding process is between approximately 25 and 50.

1 18. The method in claim 15, further comprising extending said connector through an  
2 opening in a surface of a device, such that said distal end of said bundle of optical fibers

3 one of is recessed in, is substantially flush with, and extends from a surface of said device  
4 through which said connector extends.

1 19. The method in claim 18, further comprising positioning, on said connector, a  
2 threaded jam nut adapted to engage threads in said opening.

20. The method in claim 18, further comprising positioning a seal on said connector,  
wherein said seal seals said opening.